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HABITAT MANAGEMENT

Fredrick Earl Pickering

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Project No. 9044-000

ORDER ISSUING LICENSE  
(Minor Project)

(Issued April 29, 1986)

Fredrick Earl Pickering has filed a license application under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Bigg's Creek Project, located in Clark County, Washington, on Bigg's Creek. The project would affect the interests of interstate or foreign commerce.

Notice of the application has been published. The motions to intervene that have been granted and the comments filed by agencies and individuals have been fully considered in determining whether to issue this license, as discussed below.

Summary of Findings

The design of this project is consistent with engineering standards governing dam safety. The project will be safe if constructed, operated, and maintained in accordance with the requirements of this license. Analysis and support for related license articles are provided in the Safety and Design Assessment attached to this order.

An Environmental Assessment (EA) was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Fredrick Earl Pickering (licensee) for a period of 50 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the Bigg's Creek Project.

35 FERC ¶ 62, HAB. MGMT.

This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by Exhibit G:

Exhibit G-	FERC No. 9044-	Showing
1	6	Project location
2	7	Topographic map
3	8	Real property ownership

(2) Project works consisting of: (a) a 4-foot-square, 4-foot-high concrete overflow intake structure at elevation 685 feet; (b) an 8-inch-diameter, 1,800-foot-long penstock; (c) a wood powerhouse at elevation 440 feet containing a generating unit rated at 15 kW and producing an average annual output of 50,000 kWh; (d) a 400-foot-long transmission line; and (e) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The Exhibit G described above and those sections of Exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to public notice and to the acceptance and expression in the

license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-15, (October 1975), entitled "Terms and Conditions of License for Unconstructed Minor Project Affecting the Interests of Interstate or Foreign Commerce," except Article 15. The license is also subject to the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 20 horsepower.

Article 202. The licensee shall clear and keep clear to an adequate width all lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which result from maintenance, operation, or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of lands and disposal of unnecessary material shall be done with due diligence to the satisfaction of the authorized representative of the Commission and in accordance with appropriate federal, state, and local statutes and regulations.

Article 301. The licensee shall commence construction of project works within two years from the issuance date of the license and shall complete construction of the project within four years from the issuance date of the license.

Article 302. The licensee shall, at least 60 days prior to start of construction, submit one copy to the Commission's Regional Director and two copies to the Director, Division of Inspections of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures. The Director, Division of Inspections may require changes in the plans and specifications to assure a safe and adequate project.

Article 303. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the licensee shall submit to the Commission's Regional Director and Director, Division of Inspections, one copy each of the approved cofferdam construction drawings and specifications and the letter(s) of approval.

Article 304. The licensee shall within 90 days of completion of construction file, for approval, with the Commission revised Exhibits A, F, and G to describe and show the project as built.

Article 401. The licensee shall, after consultation with the State of Washington Department of Ecology and Department of Game, and the U.S. Soil Conservation Service, prepare and file with the Commission, within 1 year from the date of issuance of this license, a plan to control erosion, dust, and slope stability, and to minimize the quantity of sediment or other potential water pollutants resulting from construction and operation of the project, including spoil disposal areas. The plan shall also include: functional design drawings and map locations of control measures; an implementation schedule; monitoring and maintenance programs for project construction and operation; and provisions for periodic review of the plan and for making any necessary revisions to the plan. Documentation of agency consultation on the plan and copies of any agency comments or recommendations shall be included in the filing.

In the event that the licensee does not concur with any agency recommendation, the licensee shall provide a discussion of the reasons for not concurring based on actual site geological, soil, and groundwater conditions. The Commission reserves the right to require changes to the plan. Unless the Director, Office of Hydropower Licensing, directs otherwise, the licensee may commence ground disturbing or spoil producing activities at the project 90 days after filing the above plan.

Article 402. The licensee shall, after consultation with the State of Washington Department of Ecology and the Department of Game, develop a detailed plan to prevent the entrainment of air into the project penstock and subsequent gas supersaturation of project discharges. Within 6 months from the date of issuance of this license, the licensee shall file with the Commission, for approval, a detailed plan, including design features of the project, to prevent the occurrence of air entrainment into the penstock and subsequent gas supersaturation. The filing shall include documentation of consultation and comments of the consulted agencies on the plan. The licensee shall file as-built drawings of the design features with the Commission within 6 months after completion of construction.

Article 403. The licensee shall, after consultation with the State of Washington Department of Game and the U.S. Fish and Wildlife Service, and within 6 months after the date of issuance of this license, file with the Commission functional design drawings of the fish screen, to be operational at the time of project start-up, for the project tailrace. The Commission reserves the right to require changes in the fish screen design. The licensee shall file as-built drawings of the screen with the Commission within 6 months after completion of construction.

Article 404. The licensee shall, prior to any future construction at the project, consult with the Washington State Historic Preservation Officer (SHPO) about the need for cultural resource survey and salvage work. Documentation of the nature and extent of consultation, including a cultural resources management plan and a schedule to conduct any necessary investigation prior to such construction, and a copy of a letter from the SHPO accepting the plan, shall be filed with the Commission 6 months before any construction activity in the location of such investigations. The licensee shall make available funds in a reasonable amount for any such work as required. If any previously unrecorded archeological or historic sites are discovered during the course of construction or development of any project works or other facilities at the project, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the licensee shall consult with the SHPO to develop a mitigative plan for the protection of significant archeological or historic resources. If the licensee and the SHPO cannot agree on the amount of money to be expended on archeological or historical work related to the project, the Commission reserves the right to require the licensee to conduct, at its own expense, any such work found necessary.

Article 405. The Commission reserves the authority to order, upon its own motion or upon the recommendation of federal or state fish and wildlife agencies or affected Indian Tribes, alterations of project structures and operations to take into account to the fullest extent practicable at each relevant stage of the decision-making process the regional fish and wildlife program developed and amended pursuant to the Pacific Northwest Electric Power Planning and Conservation Act.

Article 406. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee

shall also have continuing responsibility to administer and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which

all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) This order is issued under authority delegated to the Director and is final unless appealed to the Commission by any party within 30 days from the issuance date of this order under 18 C.F.R. 385.1902 (1985). Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

*Don Gruber*  
for Kenneth M. Pusateri  
Acting Director, Office of  
Hydropower Licensing

## I. EVALUATION OF DESIGN, CONSTRUCTION AND PERFORMANCE

The Bigg's Creek Water Power Project would be located on a small intermittent stream in the Lewis River Basin approximately five miles southwest of the town of Yacolt in Clark County, Washington. It would consist of a diversion structure, an instream intake, a penstock, an indoor type powerhouse containing a 15-kW Pelton unit, a tailrace pipe, and a transmission hook-up to the Clark County Public Utility District System.

Our review indicates that there are no engineering problems which would make construction, operation or maintenance of the project infeasible.

Construction of the project is estimated to be completed within 24 months from the date the license is issued. Article 301 would provide the licensee adequate time to initiate and complete construction.

Since the details of the design and construction procedures have not been finalized, article 302 should be included in the license requiring the licensee to submit a copy of final contract plans and specifications prior to start of construction.

Article 303 requires the licensee to review and approve the design of contractor-designed cofferdams and deep excavations to ensure that construction is consistent with the approved design.

Article 304 requires the filing with the Commission of as-built exhibits. The license will be amended to include these revised exhibits.

The proposed project structures would impound an insignificant amount of water and are not a hazard to downstream property or human life. They will be safe if constructed using sound engineering practices and upon compliance with the terms and conditions of the license.

## II. EXHIBITS

The following parts of Exhibit A and the following Exhibit F drawings conform to the Commission's rules and regulations and should be included in the license.

Exhibit A. Page 3, paragraphs 6 and 7; page 4, paragraphs 1, 3, and 4.

<u>Exhibit F Drawing</u>	<u>FERC No. 9044-</u>	<u>Description</u>
1	1	Water Inlet Structure
2	2	Power House
3	3	Pelton Wheel
4	4	Outflow from Pelton Wheel
5	5	Pelton Wheel and Generator

ENVIRONMENTAL ASSESSMENT  
Division of Environmental Analysis, Office of Hydropower Licensing  
Federal Energy Regulatory Commission  
Date: March 17, 1986

Project Name: Bigg's Creek FERC No. 9044 - 000

A. APPLICATION

1. Application Type: Minor Date Filed: 3 / 19 / 85

2. Applicant: Fredrick Earl Pickering

3. Water Body: Bigg's Creek River Basin: Lewis River

4. Nearest city or town: Yacolt

5. County: Clark State: Washington

6. Federal Lands Affected (If yes, specify land management agency.)  
☒ No ☐ Yes: \_\_\_\_\_; acreage = \_\_\_\_\_  
(agency)

B. RESOURCE DEVELOPMENT

1. Purpose: The proposed project would provide an estimated 50,000 kilowatt hours (kWh) of electrical energy per year to the Clark County Public Utility District.

2. Need for power: There is at this time available data to support an opinion that growth in the demand for electric power and energy (due to population growth, continuing demand for additional amenities, etc.) will continue. Given positive load growth and an existing resource base, a reliability need for additional resources can at any time be projected to exist at some time in the future for any power system. Additional resources would have to be obtained for any system at some point in time in order to meet projected additional load requirements with the same degree of reliability established by an existing criterion for the system. Timing of the need would vary in different systems dependent upon, among other things, the rates of load growth, the load characteristics, the available existing power resources and the reliability criteria established for each system.

Installation of a power resource prior to the existence of a reliability need can be justified if early installation of the resource will over its operating life provide benefits relative to operation of the system with the most likely alternative resource installed to meet the reliability need when it occurs. The early installation of a hydroelectric resource and the use of hydroelectric energy to displace more expensive thermal energy generation coupled with the incremental deferral of a thermal capacity alternative can produce economic benefits. Fossil fuel conservation and reduced atmospheric impacts of fossil fuel combustion are additional benefits of hydroelectric displacement and deferral of the thermal generation.

The Northwest Power Planning Council (Council), in the 1985 Northwest Conservation and Electric Power Plan (Plan), projects a regional need for additional power resources by 1992 based on a mid-high growth rate forecast and by 1996 based on a mid-low growth rate forecast (the two equally likely and most probable growth rate scenarios).



The Bonneville Power Administration forecast released in December 1984 and the Pacific Northwest Utilities Conference committee forecast issued in March of 1985 show regional energy deficits for mid-range load forecasts in the 1997-1998 and 1995-1995 periods, respectively. Individual systems within the region also indicate resource deficits exist prior to the regional deficits.

Staff's economic analyses show that benefits are possible through installation of the project and, therefore, show a need for the project. From the time the project goes on line until needed to serve load directly, it will be available to off-load existing fossil-fueled electric generating plants located in the Pacific Northwest, California, and the Southwest, thereby conserving nonrenewable resources and reducing the emission of noxious by-products caused by the combustion of fossil fuels.

In accordance with the Pacific Northwest Electric Power Planning and Conservation Act (Act) passed by Congress in December 1980, the Council also prescribed a spectrum of resources to meet power needs through the year 2005 for each of the respective load forecast scenarios. In both the mid-low and mid-high forecast scenarios these resources include cost effective conservation, hydroelectric generating resources, and thermal generating resources to firm-up secondary energy; additional cogeneration and coal-fired resources are included to meet the mid-high forecast scenario.

Since the Act grants a higher priority to the use of renewable-resource generation relative to the use of fossil-fuel generation, the installation of reliable, cost effective, and environmentally acceptable hydroelectric resources to defer the thermal generation included in the Council plan is justifiable under the Act.

The recent and ongoing modifications to increase the carrying capacity of transmission lines connecting the Pacific Northwest, California and the Southwest will allow a significantly greater transfer of power than has occurred historically thus providing an expanded market for economic project power.

3. Hydroelectric power and resource utilization: Staff's independent analysis of the hydropower potential at the Bigg's Creek Project site determined that the applicant's proposed installed capacity, estimated average annual generation, selection of size and type of generation unit, and construction cost estimate are reasonable for adequate development at the site.

The project would have installed capacity of 15 kilowatts (kW). The powerplant would generate an estimated average 50,000 kilowatthours (kWh) annually at a plant factor of 38 percent. No minimum instream flow releases would be required for the bypass reach of Bigg's Creek. The powerplant would operate run-of-river under a gross head of 240 feet and would utilize creek flows up to 2 cfs. The average annual flow at the site is 0.6 cubic foot per second (cfs).

Power generated by the project would be sold to the Clark County Public Utility District. The project is economically feasible when the cost of project power is compared to the cost of generating equivalent power in the Northwest adjusted for escalation, 12 percent cost of money, and an average annual generation of 50,000 kWh. Agency comments would not impact upon the safety, adequacy, or economic feasibility of the project.

The project is not in conflict with any existing or planned development, and makes good use of the flow and fall of Bigg's Creek under present conditions upon compliance with the terms and conditions of the license.

## C. PROPOSED PROJECT AND CONSTRUCTION

1. Description of the proposed action: The proposed project would consist of (a) a 4-foot-square, 4-foot-high concrete weir flow intake structure; (b) a 4-foot-diameter, 1,800-foot-long penstock; (c) a wood powerhouse of 15 kW; and (d) a 400-foot-long transmission line.

## 2. Applicant's Proposed Mitigative Measures

a. Construction: The applicant proposes to construct the project during the summer, when flows in Bigg's Creek cease, and to promptly replant disturbed areas with native plant species in order to minimize erosion and downstream sedimentation.

b. Operation: The intake structure would be designed to prevent air entrainment and subsequent gas supersaturation of project discharges. The velocity of discharge would be reduced to less than 1.5 foot per second to prevent the false attraction of upstream migrating fishes. A screen with 1 inch openings would be placed at the tailrace outlet to prevent the entry of fishes.

## 3. Section 4(e) Conditions

☒ Not applicable ☐ Applicable, but none have been provided.

Pursuant to Section 4(e) of the Federal Power Act, the Federal land management agency has provided terms and conditions by letter dated: \_\_\_\_/\_\_\_\_/\_\_\_\_ (Attachment \_\_\_\_).

Remarks: \_\_\_\_\_

- a. X No other reasonable action alternatives have been found.

Action alternative:

b. Alternative of no action: The 15-kW of electrical energy that would be generated by the proposed hydroelectric project would instead have to be generated from a coal, gas, oil, or nuclear-fueled electrical operation.

#### D. AFFECTED ENVIRONMENT

1. Brief descriptions of the resources are given below.

### a. Geology and Soils

Significant features include: sedimentary rocks from the Lower Tertiary period underlay the project area, while soils along Bigg's Creek consist of mixed alluvium.

## b. Streamflow

low flow: — cfs; flow parameter: no flow from July to September  
high flow: 10 cfs; flow parameter: average high flow, Dec. and Jan.  
average flow: 0.6 cfs; Remarks: Bigg's Creek is an intermittent stream  
that flows underground for 300 feet before entering Charley Creek.

### c. Water Quality

The existing water quality conditions are: generally good. No water quality data for Bigg's Creek exists, but the forested nature of the upstream watershed probably ensures low nutrient levels and temperatures, and the steep gradient (10 to 20%) maintains dissolved oxygen levels near saturation.

#### d. Fisheries

Anadromous: None X Species include: steelhead trout.

Resident: X None \_\_\_\_\_ Species include: \_\_\_\_\_

Significant features include: None.

### e. Vegetation

Cover Type	Dominant Species
Upland Forest	Douglas fir, red alder, black cherry, and bigleaf maple.
Agricultural	Orchard grass and fescues.

### f. Wildlife

Species inhabiting the project area include: Black-tailed deer, coyote, raccoon, porcupine, varying hare, beaver, mountain beaver, Douglas squirrel, ruffed grouse, and mallard duck.

Significant features include: Black-tailed deer, ruffed grouse, and mallard.

q. Archeological

- X There are no known prehistoric sites in the project impact areas.  
 \_\_\_ Known sites occur within the project impact areas. Description:

Remarks:

#### h. Historical

- X There are no sites of historical significance in the project impact areas.  
 \_\_\_ The areas contain sites of historical significance. Description:

The structures described above are: ☐ listed on the National Register.  
☐ eligible for listing.  
☐ not listed on the National Register.

Remarks:

### i. Visual Quality

The significant visual features of the area include: the East Fork Lewis River Valley, including the approximately 20-foot-high Lucia Falls.

### j. Recreation

The existing recreational use(s) of the area include: horseback riding, picnicking, and hunting. As the project occurs entirely on the applicant's property, recreational use of the area is limited to the applicant's family and guests.

### k. Land Use

Land use in the project area includes: logging, tree farming, and agriculture.



1. Socioeconomics

The economic and social well-being of the area is influenced by: logging, agriculture, and the nearby urban areas of Vancouver, Washington and Portland, Oregon, located approximately 25 miles south of the project area.

m. Ambient noise quality is: low, given the rural location of the area.

n. Ambient air quality is: good, as the project is located 25 miles north of the highly urbanized areas of Vancouver, Washington and Portland, Oregon.

o. Other resources include: \_\_\_\_\_

E. CONSULTATION AND COMPLIANCE

1. Fish and Wildlife Consultation (Fish & Wildlife Coordination Act)

- (a) Fish & Wildlife Service (FWS): X Yes    No (b) State(s): X Yes    No  
(c) National Marine Fisheries Service (NMFS): X Yes    No  
(d) Remarks: \_\_\_\_\_

2. Terms and Conditions for Exemptions from Licensing (18 CFR §4.106(b) or 4.94(b))

The agencies listed below have provided terms and conditions for the proposed project (Attachment \_\_\_\_\_).

X Not applicable

Agency

Date of Letter

_____	____/____/____
_____	____/____/____
_____	____/____/____

3. Section 7 Consultation (Endangered Species Act)

(a) X Listed Species: None.

(b) X Not required.    Required; completed (date):   /\_\_\_\_/\_\_\_\_

(c) Remarks: \_\_\_\_\_

4. Section 401 Certification (Clean Water Act)

   Not Required X Received    Waived    Requested: 2 / 4 / 86  
(date of letter)

5. Cultural Resource Consultation (Historic Preservation Act)

- (a) Register Status: X None    Potentially Eligible    Eligible or Listed  
(b) State Historic Preservation Officer (SHPO): X Yes    No  
(c) National Park Service (NPS):    Yes X No  
(d) Council: X Not required    Completed (date):   /\_\_\_\_/\_\_\_\_  
(e) Further consultation requirements:    Yes X Not required  
(f) Remarks: \_\_\_\_\_

6. Recreation Consultation (Federal Power Act, §10(a))

- (a) U.S. Owners    Yes X No (b) NPS:    Yes X No  
(c) State(s):    Yes X No (d) Remarks: \_\_\_\_\_

7. Wild and Scenic Rivers (Wild and Scenic Rivers Act)

- (a) Status: X None    Listed. Determination completed:    /    /     
Administering agency: \_\_\_\_\_  
(b) Remarks: \_\_\_\_\_

F. COMMENTS

1. The following entities provided comments on the application in response to the public notice dated 5 / 17 / 85.

Commenting Entity	Date of Letter
Washington Department of Game	9 / 13 / 84
	7 / 12 / 85*
	8 / 29 / 85
United States Department of the Interior	7 / 24 / 85
U.S. Fish and Wildlife Service	11 / 7 / 85
	____/____/____
	____/____/____
	____/____/____
	____/____/____

\* Indicates an intervention

2. The Applicant responded to the comments by letter dated 9 / 17 / 85.

G. DISCUSSION OF ENVIRONMENTAL ISSUES

Mitigative measures recommended by Staff are in addition to those proposed by the applicant, Section C(2), and those conditions identified in Sections C(3) and E(2), as appropriate. There are 6 issues addressed below.

1. Issue: Land-disturbing activities associated with construction of project features, including the penstock, powerhouse, and tailrace, would result in minor, short-term increases in turbidity and sedimentation in Charley Creek.

Comments: The Washington Department of Game (WDG) recommends that the applicant should control sedimentation by limiting construction to the dry season, ensuring that concrete and other materials are not allowed to enter the stream, and promptly revegetating disturbed areas with plants useful to wildlife.

Applicant's Response: The applicant has proposed to construct the project during the summer months and to revegetate all disturbed areas.

Conclusions and Recommendations: The potential for sedimentation-related impacts would be largely limited to Charley Creek, as Bigg's Creek flows underground for several hundred feet before entering Charley Creek. Construction-related sedimentation, which can reduce the suitability of fish habitat and the production of aquatic fish food organisms (Rochester et al., 1984), should be minimized to protect the fishery resources of Charley Creek. The licensee should develop a detailed plan to protect water quality of downstream areas during project construction and operation.

2. Issue: Entrainment of air into the intake could result in gas supersaturation of project discharges and could lead to gas bubble disease in fish of Charley Creek.

Comments: The WDG recommends that the intake be designed to prevent air entrainment and resultant gas supersaturation in the powerhouse discharge.

Applicant's Response: The applicant states that either sufficient depth will be provided at the penstock intake or the intake will be baffled to prevent air entrainment, and that pressurized gases will be allowed to dissipate before entering Charley Creek.

Conclusions and Recommendations: Weitkamp and Katz (1980) stated that gas supersaturation can occur in any situation that allows the mixing of air with water under pressure much greater than one atmosphere, given adequate volumes of air. The applicant has proposed generalized measures to prevent air entrainment, but as yet, a specific plan has not been prepared. Therefore, the licensee should provide a detailed plan to prevent air entrainment at the intake and subsequent gas supersaturation of project releases.

Issue: Upstream migrating fish in Charley Creek would be falsely attracted to project discharges and fish that enter the tailrace would be subject to stranding when the project is shut down.

Comments: The WDG recommends that the tailrace outlet should be designed to prevent fish from being attracted and delayed or killed, and specifies that a screen with 1 inch openings should be placed at the tailrace outlet.

Applicant's Response: The applicant has proposed to place a screen with 1 inch openings at the tailrace outlet to prevent the false attraction of fish.

Conclusions and Recommendations: The attraction of upstream migrating fish to the project tailrace should be prevented to minimize migration delays and to prevent fish from entering the tailrace where they could be injured or stranded when the project is shut down. Therefore, the project tailrace outlet should be screened, with the screen openings not to exceed 1 inch.

- Issue: No known archeological or historic sites will be affected by the project.

Comments: None.

Applicant's Response: None.

Conclusions and Recommendations: The licensee should protect archeological and historic sites in the event that such sites are discovered during construction, and in the event of any future construction at the site.

- Issue: The issue of cumulative impacts relating to the proposed project was raised by the WDG.

Comments: The WDG states that the construction of the project could have as yet unidentified impacts and cause other losses to resources under the jurisdiction of the WDG. The WDG further states that the cumulative effects caused by the presence and operation of this and other projects in this river system must be evaluated.

Applicant's Response: None.

Conclusions and Recommendations: The Bigg's Creek Hydroelectric Project represents the only pending license application in the Lewis River. Therefore, the proposed action would not contribute to any potential cumulative impacts.

6. Issue: The proposed project occurs in the Columbia River Basin and is therefore subject to the provisions of the Columbia River Basin Fish and Wildlife Program (Program).

Conclusions and Recommendations: Pursuant to Section 4(h) of the Act, the Council developed the Program to protect, mitigate, and enhance fish and wildlife resources affected by the development and operation of hydroelectric projects on the Columbia River and its tributaries. Section 4(h) states that responsible federal agencies should exercise their responsibilities to provide equitable treatment for fish and wildlife resources with other purposes for which hydropower is developed. It further states that these agencies shall take into account to the fullest extent practicable the Program adopted thereunder. Agencies are directed to consult with federal and state fish and wildlife agencies, appropriate Indian Tribes, and affected project operators in carrying out the provisions of this paragraph.

Section 1200 of the Program provides a framework for assessing and mitigating the impacts of new hydroelectric development on fish and wildlife resources and lists a number of mitigative measures that should be implemented. The relevant federal and state fish and wildlife agencies have reviewed and commented on the application. In addition, the license provides for mitigative measures to protect fish and wildlife resources, and is consistent with Section 1200.

The Commission reserves the authority to require future alterations in project structures and operations in order to take into account to the fullest extent practicable the Council's Program. Therefore, the issuance of this license is consistent with the Act and the Program developed thereunder.

# H. SUMMARY OF ENVIRONMENTAL IMPACTS

1. Assessment of adverse and beneficial impacts expected from the project as proposed by the Applicant (P); the proposed project with Staff's recommended mitigation (Ps) [Section G]; and any other alternative considered (A). \*

Resource	Impact			Remarks
	P	Ps	A	
a. Geology/Soils	IAS			b. Project-induced flow reductions of up to 2 cfs would occur in the 1,100-foot-long bypass reach; however, no minimum flow releases from the diversion structure would be required as Bigg's Creek flows underground before entering Charley Creek and does not support any fish populations.
b. Streamflow	IAL			
c. Water quality:				
Temperature	O			
Dissolved oxygen	O			
Turbidity and sedimentation	IAS			
Other:				
d. Fisheries:				
Anadromous	IAS			
Resident	O			
e. Vegetation	IAS			
f. Wildlife	IAS			
g. Archeological	O			
h. Historical	O			
i. Visual quality	IAL			
j. Recreation	IAS			
k. Land use	O			
l. Socioeconomics	O			
m. Noise quality	IAS			
n. Air quality	IAS			

\* For licenses, the assessment reflects the adoption of any Federal land management agency 4(e) conditions, in addition to the Applicant's proposed mitigation. For exemptions, the assessments reflect any terms and conditions set by the agencies, in addition to the Applicant's proposed mitigation. Assessment symbols indicate the following impact levels:

O = No impact; 1 = Minor impact; 2 = Substantial impact; 3 = Major impact;  
A = Adverse; B = Beneficial; L = Long-term impact; S = Short-term impact.

(e.g., IBL = Minor, beneficial, long-term impact)

2. Impacts of the No-action Alternative

No action would result in the continuation of existing environmental conditions. No electrical energy would be generated at the site.

3. Recommended Alternative (including proposed, required, and recommended mitigative measures): ☒ Proposed Project ☐ Alternative action ☐ No action

4. Reason(s) for the Selection of the Preferred Alternative

The proposed project, with the recommended mitigative measures, would achieve the project purpose of electric power generation without significantly affecting the quality of the human environment.

I. SUMMARY OF UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS AND BENEFICIAL IMPACTS

Ground-disturbing activities during project construction would result in temporary, localized sedimentation which would, in turn, reduce water quality. Construction activities would also result in minor, short-term increases in noise and dust and disturbance of downstream fishery resources, wildlife habitat, and recreational activities. The diversion of up to 2 cfs for project operation would result in minor, long-term flow reductions in the 1,100-foot-long free-flowing portion of the bypass reach. The presence of project facilities would alter the visual quality of the project area.

J. CONCLUSION

☒ Finding of No Significant Impact. Approval of the recommended alternative [H(3)] would not constitute a major Federal action significantly affecting the quality of the human environment; therefore, an Environmental Impact Statement (EIS) will not be prepared.

☐ Intent to Prepare an EIS. Approval of the recommended alternative [H(3)] would constitute a major Federal action significantly affecting the quality of the human environment; therefore, an Environmental Impact Statement will be prepared.

K. LIST OF PREPARERS

Name	Position Title
Robert J. Krska	Fishery Biologist (Coordinator)
Edwin Slatter	Archeologist
Martin Thorpe	Electrical Engineer
Ronald Kowalewski	Civil Engineer

L. LITERATURE CITED

1. Rochester, H., Jr., T. Lloyd, and M. Farr. 1984. Physical impacts of small-scale hydroelectric facilities and their effects on fish and wildlife. U.S. Fish and Wildlife Service. FWS/OBS-84/19. 191 pp.

2. Weitkamp, D. E., and M. Katz. 1980. A review of dissolved gas supersaturation literature. Transactions of the American Fisheries Society 109: 659-702.

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FEDERAL POWER COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR UNCONSTRUCTED  
MINOR PROJECT AFFECTING THE INTERESTS OF  
INTERSTATE OR FOREIGN COMMERCE

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes

made without the prior approval of the Commission, will in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Upon the completion of the project, or at such other time as the Commission may direct, the Licensee shall submit to the Commission for approval revised exhibits insofar as necessary to show any divergence from or variations in the project area and project boundary as finally located or in the project works as actually constructed when compared with the area and boundary shown and the works described in the license or in the exhibits approved by the Commission, together with a statement in writing setting forth the reasons which in the opinion of the Licensee necessitated or justified variation in or divergence from the approved exhibits. Such revised exhibits shall, if and when approved by the Commission, be made a part of the license under the provisions of Article 2 hereof.

Article 4. The construction, operation, and maintenance of the project and any work incidental to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, Federal Power Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project and for any subsequent alterations to the project. Construction of the project works or any feature or alteration thereof shall not be initiated until the program of inspection for the project works or any such feature thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other



officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative.

The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 7. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 8. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 9. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

Article 10. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 11. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 12. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall

permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 13. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 14. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 15. The Licensee shall consult with the appropriate State and Federal agencies and, within one year of the date of issuance of this license, shall submit for Commission approval a plan for clearing the reservoir area. Further, the Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition,

all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. Upon approval of the clearing plan all clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 16. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 17. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 18. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.